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ECLIPSES, 1885.

IN the year 1885 there will be four eclipses,—two of the sun, and two of the moon.

I. An annular eclipse of the sun, March 16; visible in North America generally as a partial eclipse,—being annular within a belt 35 miles wide, drawn through Weaverville and Fort Bidwell, Cal.; Idaho and Boise Cities, Idaho; Bannack City and Gallatin, Montana; Hudson Bay and Greenland,—occurring as follows:—

STANDARD TIME:	Begins.	Ends.	Annular.
	H. M.	H. M.	H. M.
Bangor, Me.	o 23 A.	2 58 A.	- -
Boston, Mass.	o 20 A.	2 53 A.	- -
New York, N.Y.	o 13 A.	2 46 A.	- -
Philadelphia, Penn.	o 10 A.	2 43 A.	- -
Buffalo, N.Y.	o 2 A.	2 42 A.	- -
Pittsburg, Penn.	11 58 M.	2 38 A.	- -
Cincinnati, O.	o 48 M.	1 29 A.	- -
Chicago, Ill.	o 45 M.	1 30 A.	- -
Nashville, Tenn.	o 41 M.	1 22 A.	- -
St. Louis, Mo.	o 37 M.	1 20 A.	- -
Omaha, Neb.	o 28 M.	1 15 A.	- -
Baltimore, Md.	o 7 A.	2 40 A.	- -
Washington, D.C.	o 6 A.	2 39 A.	- -
Charleston, S.C.	11 57 M.	2 24 A.	- -
Savannah, Ga.	o 54 M.	1 21 A.	- -
Jacksonville, Fla.	o 53 M.	1 17 A.	- -
Raleigh, N.C.	o 50 A.	2 31 A.	- -
Mobile, Ala.	o 33 M.	1 11 A.	- -
New Orleans, La.	o 28 M.	1 8 A.	- -
Memphis, Tenn.	o 33 M.	1 15 A.	- -
Galveston, Tex.	o 15 M.	1 0 A.	- -
St. Paul, Minn.	o 38 M.	1 25 A.	- -
Denver, Col.	9 10 M.	o 1 A.	- -
Salt Lake City, Utah	9 3 M.	11 52 M.	- -
Santa Fé, N. Mex.	9 3 M.	11 53 M.	- -
San Francisco, Cal.	7 48 M.	10 30 M.	- -
Portland, Ore.	8 2 M.	10 41 M.	-
Boise City, Idaho	9 3 M.	11 49 M.	10 23 M.
Bannack, Montana	9 8 M.	11 57 M.	10 30 M.
Weaverville, Cal.	7 52 M.	10 33 M.	9 8 M.
Fort Bidwell, Cal.	7 57 M.	10 39 M.	9 14 M.

Duration of annulus, from $\frac{1}{2}$ to $\frac{3}{4}$ of a minute.

II. A partial eclipse of the moon, March 30; invisible in America; visible in Asia, Australia, eastern portions of Europe and Africa, and the western Pacific Ocean.

III. A total eclipse of the sun, Sept. 8; invisible in North America; visible chiefly in the South Pacific Ocean.

IV. A partial eclipse of the moon, Sept. 23, 24; visible in North and South America and the Atlantic and Pacific Oceans, happening as follows:—

STANDARD TIME:	Eastern.	Central.	Mountain.	Pacific.
Moon enters penum- bra	D. H. M.	D. H. M.	D. H. M.	D. H. M.
Moon enters shadow	24 o 0 M.	23 11 o A.	23 10 o A.	23 9 o A.
Middle of the eclipse	24 1 14 M.	24 0 14 M.	23 11 14 A.	23 10 14 A.
Moon leaves shadow	24 2 48 M.	24 1 48 M.	24 0 48 M.	23 11 48 A.
Moon leaves penum- bra	24 4 22 M.	24 3 22 M.	24 2 22 M.	24 1 22 M.

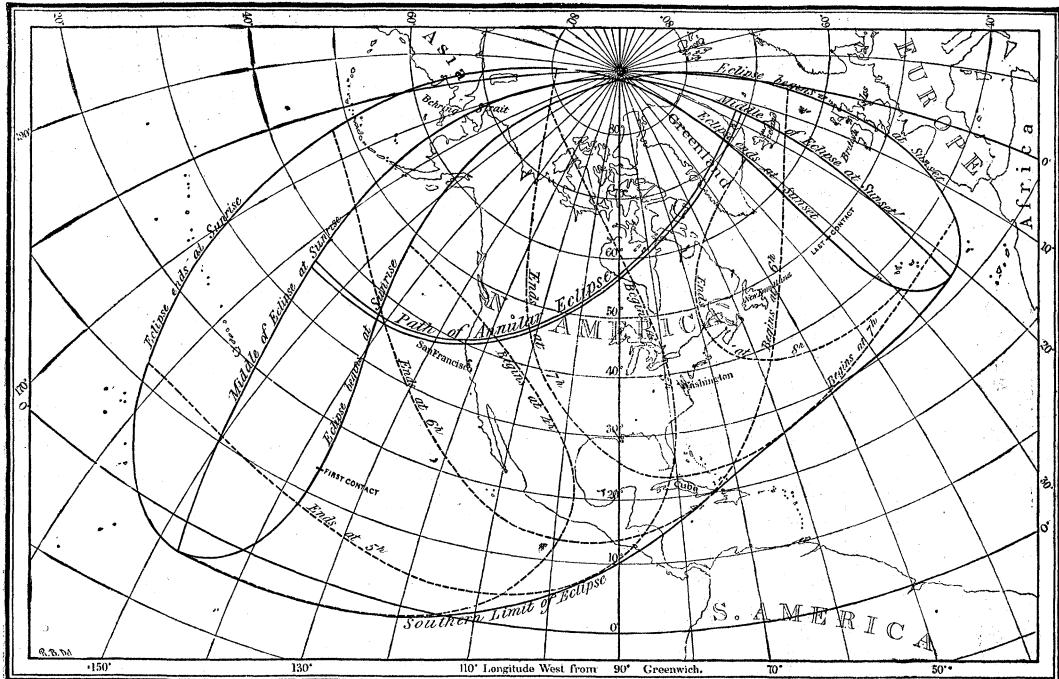
Magnitude of eclipse = 0.79 (moon's diameter = 1).

SYMBOLS.

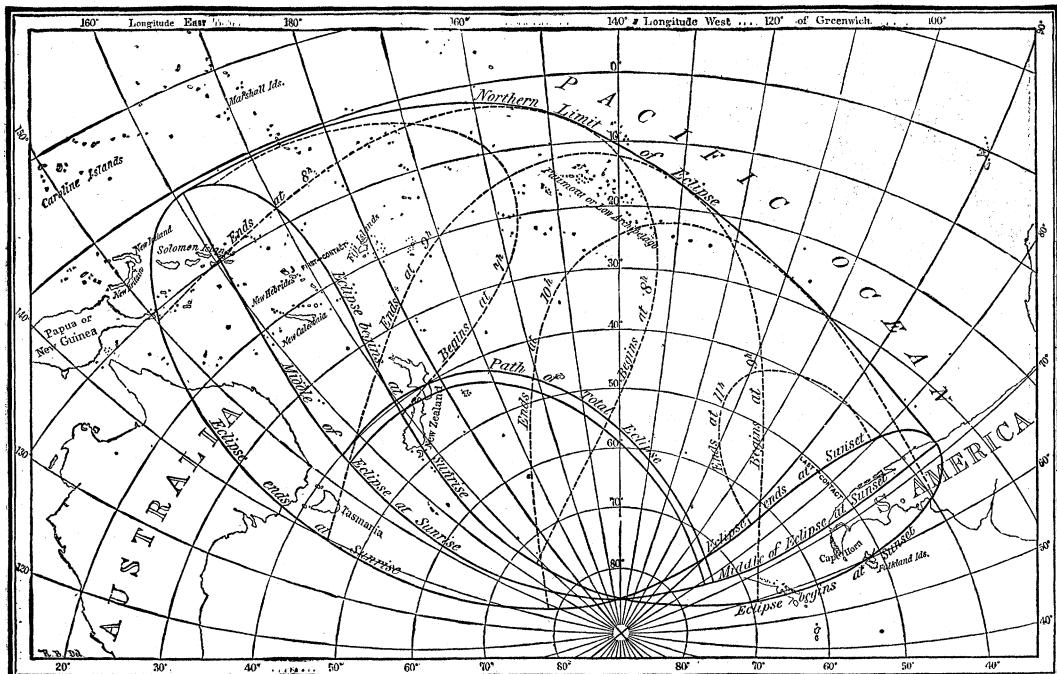
○ . . .	The Sun.	♂ . . .	Mars.
□ . . .	The Moon.	♀ . . .	Jupiter.
♀ . . .	Mercury.	♃ . . .	Saturn.
♂ . . .	Venus.	♄ . . .	Uranus.
⊕ . . .	The Earth.	♅ . . .	Neptune.
△ . . .	Moon runs high.	▽ . . .	Moon runs low.
○ . . .	Conjunction, or having the same longitude or right ascension.	□ . . .	Quadrature, or differing 90° in longitude or right ascension.
□ . . .	Opposition, or differing 180° in longitude or right ascension.	○ . . .	Ascending node.
○ . . .	Descending node.	S . . .	Appended to the stars, 'souths,' or crosses the meridian.
♈ . . .	Aries.	♎ . . .	Libra.
♉ . . .	Taurus.	♏ . . .	Scorpio.
♊ . . .	Gemini.	♐ . . .	Sagittarius.
♋ . . .	Cancer.	♑ . . .	Capricornus.
♌ . . .	Leo.	♒ . . .	Aquarius.
♍ . . .	Virgo.	♓ . . .	Pisces.

SUN-TIME AND CLOCK-TIME.

ONE very often hears some friend say, when extolling the merits of his watch, that he sets the sun by it. It is doubtless supposed by many that the sun is most regular in its habits, and crosses the meridian exactly at noon; and it was with a feeling of regret at parting company with a so-called faithful time-keeper, that many set their watches to standard time on the 19th of November, 1883. If the orbit of the earth were perfectly circular, and the sun revolved around an axis perpendicular to the plane of the orbit, then the sun would have the reliable character with which it is now credited; but, unfortunately, the orbit is not circular, and the earth revolves about an axis inclined to the plane of the orbit, so that the apparent motion of the sun varies in rate from time to time through the year. And as it is convenient for us to have our days of equal length, the mean time to which we set our clocks differs from solar time by as much as fifteen minutes on the 10th of February, and fully sixteen minutes on the 27th of October. The relation between mean time (the time we use on our clocks and watches) and solar or apparent time (that of the sun-dial) is readily



ANNULAR SOLAR ECLIPSE OF MARCH 16, 1885.



TOTAL SOLAR ECLIPSE OF SEPTEMBER 8, 1885.

seen from the accompanying diagram; and what is meant by the equation of time, which is nothing more than the difference between mean time and

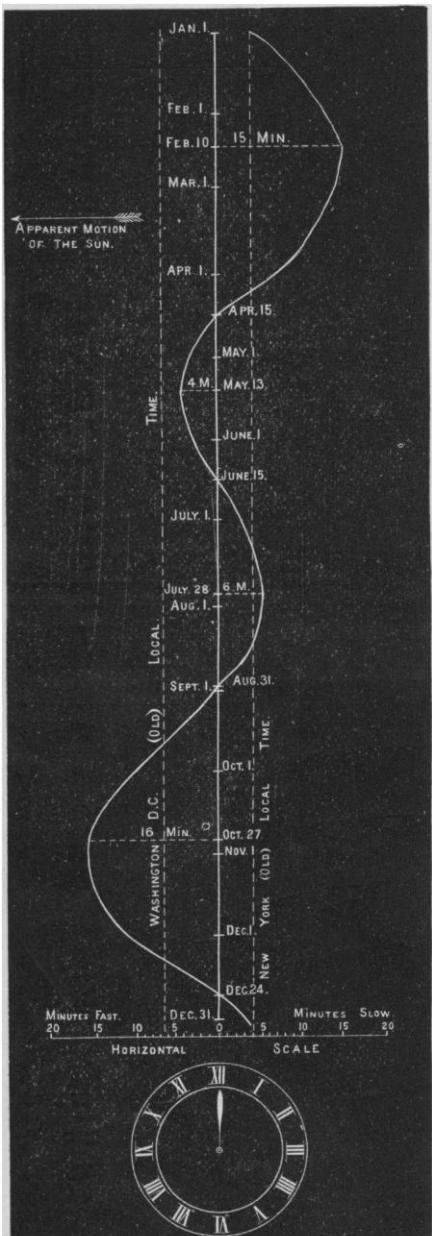


DIAGRAM SHOWING COMPARISON OF MEAN (OR CLOCK) TIME WITH SOLAR (OR APPARENT) TIME AT THE SEVERAL SEASONS OF THE YEAR. THE PERPENDICULAR CENTRAL LINE REPRESENTS MEAN TIME, AND THE CURVED LINE SOLAR TIME, AT MEAN NOON. (Borrowed, by permission, from the *Popular science monthly*.)

solar time, may be seen by a glance, and is given by the length of a horizontal line running from the vertical line through the zero of the scale, to a point on the curve corresponding to the date for which the equation of time is desired. For all ordinary purposes, the diagram is sufficiently accurate; although, of course, it has not all the refinements which might be suggested, as, in fact, a single diagram could not be given for all years.

NEW MAPS OF THE HEAVENS.

"Nature and Nature's laws lay hid in night.
God said, 'Let Newton be!' and all was light."

POPE.

THE accompanying maps represent the heavens from the north pole to 30° south of the equator, and include all stars to the $4\frac{1}{2}$ magnitude inclusive. In some instances those of the $4\frac{1}{2}$ magnitude have been incorporated for the sake of configuration, and convenience of identification.

The maps also include portions of the milky way, the paths of the planets during the year, with their location in these paths at certain definite intervals. From these the position of any planet for any date can be obtained with sufficient accuracy for finding-purposes.

The numbers around the circumference of the circular map, and at the top and bottom of the rectangular maps, indicate hours of right ascension; and the other figures along the line of 0 and 12 hours, every ten degrees of declination. The curving line represents the ecliptic or apparent path of the sun in the heavens.

The months at the borders indicate the part of the heavens that would be on the meridian at nine o'clock in the evening at the various times expressed. Thus, on Jan. 1, the stars along the line of 3.7 hours would be crossing the meridian at nine o'clock in the evening, and on Feb. 1 those on the meridian of 5.8 hours, etc.

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